

REMARKS

This paper is responsive to the Non-Final Office Action dated 01 October 2009 wherein claims 2-34 and 36-40 were rejected. Claims 2-34 and 36-40 remain pending in this application. In view of the following remarks, Applicant requests further examination and reconsideration of the present patent application.

Examiner's Response to Arguments

Applicants hereby submit a response on Examiner's Response to Arguments, identifying the response by the corresponding number in the Non-Final Office Action:

Applicants respectfully submit that the pressure regulator 14 of the instant invention is not equivalent to the valve 12 of Bergquist. Applicants further submit that the Figure 1 shows the pressure regulator 14 with a symbol of a pressure regulator and not that of a conventional valve, as alluded to in the Office Action.

As submitted earlier, Applicants respectfully traverse that the Bergquist valve has the identical structure to Applicant's disclosed valve. Accordingly, Applicants submit that the claimed invention is structurally different and patentably distinct from the applied art.

Applicants submit that in drawing analogy to Smith's pump, the Office Action disregards the part-to-part relationship in recreating the structure.

Applicants respectfully submit that inclusion of a fuel boost pump as claimed is structurally different and patentably distinct from the applied art.

The Office Action states in point 15 that the passage (col. 3, lines 55-57) cited previously by the Applicants is not relevant to how the Smith pump operates, and more specifically, that the inlet and the outlet mentioned in the cited passage are the inlet and outlet of a flow sensor. Applicants respectfully traverse this statement because the Smith pump supplies fuel via the sensor (col. 2, line 9-11).

Applicants respectfully submit that the references are not combinable, and even if somehow the references were combined in the manner suggested by the Office Action, the combination will render the Bergquist device unsuitable for its intended use.

35 USC §103

The Examiner rejected claims 4-11,14-21,34,38-40 under 35 USC §103(a) as being unpatentable over U.S. Patent No. 4,749,005 (hereinafter "Bergquist") in view of U.S. Patent No. 5,795,998 (hereinafter "Smith") and applicant's admitted prior art. The Applicants respectfully traverse these rejections.

The Examiner also rejected claims 2,3,12,13,22,23,28-33,36,37 under 35 USC §103(a) as being unpatentable over U.S. Patent No. 4,749,005 (hereinafter "Bergquist") in view of U.S. Patent No. 5,795,998 (hereinafter "Smith"), further in view of U.S. Patent No. 5,924,857 (hereinafter "Frasnetti"). The Applicants respectfully traverse these rejections.

The Examiner further rejected claims 22-27 under 35 USC §103(a) as being unpatentable over U.S. Patent No. 4,749,005 (hereinafter "Bergquist") in view of U.S. Patent No. 5,795,998 (hereinafter "Smith"), further in view of U.S. Patent No. 6,287,108 (hereinafter "Rothenberger"). The Applicants respectfully traverse these rejections.

Legal Precedent and Guidelines

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.

When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. Additionally, it is improper to combine references where the references teach away from their combination. Moreover, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. If the proposed modification or combination would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.

Claim 40, 11 and 34

Independent claim 40 recites, *inter alia*, "a pressure regulator adapted to regulate a gas flow from a gas feed line; a gas burner coupled to the pressure regulator and comprising at least one orifice, said orifice coupled to a venturi; and a gas fuel boost pump disposed downstream of the pressure regulator and configured to increase a primary air entrainment in the venturi by increasing pressure of the gas flow." (Emphasis added)

Independent claim 11 recites, *inter alia*, "a pressure regulator adapted to regulate gas flow from a gas feed line; a gas fuel boost pump placed downstream of the pressure regulator and adapted to increase a pressure of the gas flow received from the gas feed line; a gas

burner disposed to receive the gas flow from the gas fuel boost pump; and a transducer disposed upstream of the gas burner and adapted to measure a parameter of gas flow from the gas fuel boost pump pressure at a predetermined location." (Emphasis added)

Independent claim 34 recites, *inter alia*, "a pressure regulator adapted to regulate a gas flow from a gas feed line; a gas fuel boost pump disposed downstream of the pressure regulator and adapted to increase primary air entrainment of the gas flow received from the gas feed line; and a gas burner disposed for receiving the gas flow from the gas fuel boost pump." (Emphasis added)

Applicants submit that independent claims 1, 11, 34 recite, in generally similar language, the gas range system including *gas fuel boost pump disposed downstream of the pressure regulator* and configured to *increase pressure* of a gas flow received from the pressure regulator.

According to the Office Action, Bergquist shows a method of enhancing burner performance and a gas range system that includes a pressure regulator in the form of a actuating device (12), which functions to regulate gas flow through a gas feed line (10). Further the Office Action states that the pressure regulator is upstream of a second flow regulator (C), which is connected to burners (22), and further, the second flow regulator performs the functions listed in the claims, including supplying gas to the burners at a regulated pressure. The Examiner acknowledges the fact that the second flow regulator (C) is not disclosed to be a fuel boost pump. Further, the Examiner states that it is unclear if the Bergquist device includes a microcontroller.

Applicants submit that, first, the primary reference Bergquist fails to disclose a pressure regulator as recited by the independent claim 1. In sharp contrast, the valve 12, in Bergquist is a shut off valve used to terminate flow of gas as evident in col. 8, lines 13-16:

"A main or gas line supply shut off valve 12 is mounted to the gas supply line adjacent its emergency from the wall for terminating the flow of gas when no appliance is connected thereto." (Emphasis Added)

While the pressure regulator in the instant invention provides a *pressure regulated gas*, the valve 12 of Bergquist is clearly a supply shut-off valve. As is evident from the nomenclature used, as well as the description in Bergquist, the valve 12 merely serves to terminate the flow of gas when no appliance is connected. The valve 12 does not provide a pressure regulated gas as provided by the pressure regulator of the instant invention (see Applicants' Specification, paragraph [0016]). The Office Action fails to acknowledge part-to-part relationship of the valve

12 in Bergquist while applying the reference to meet the instant claim.

Further, it is well established in the art that a pressure regulator in a domestic cooking range appliance provides a pressure regulated gas flow, while a supply shut-off valve merely either shuts-off the supply in case of no appliance being connected, or switches on the supply of gas in case an appliance is connected. Applicants further traverse the Office Action statement that Figure 1 of the Applicants' Specification shows the pressure regulator (14) illustrated with a conventional valve symbol. Applicants respectfully submit that the symbol illustrated in Figure 1 by the numeral 14 (which is the device in between the elements denoted by numerals 12 and 16) is a symbol for a pressure regulator, which symbol is not only different from the symbol of a conventional valve, but further the pressure regulator is also structurally different and functionally distinct from the valve 12 of Bergquist. The Office Action suggests, in point 8 that Figure 1, the pressure regulator 14 is illustrated with a conventional valve symbol, the pressure regulator 14 is actually a valve (Office Action, point 10). Applicants respectfully disagree and submit that even if the symbol denoted by the numeral 14 of Figure 1 did not identify a pressure regulator distinctly, the written description clearly provides that the device denoted by numeral 14 is a pressure regulator, which supplies a pressure regulated gas in the tubing 16. It is evident that the valve 12 does not provide a pressure-regulated gas, as provided by the pressure regulator 14 in the instant invention. Furthermore, it is well established in the art that a supply valve and a pressure regulator are structurally different devices and serve distinct functionalities, which the Office Action fails to acknowledge.

Even furthermore, Applicants note that Bergquist discloses a pressure regulator combined with a manual shut off valve, denoted by the letter 'C', and that the combined pressure regulator and manual shut off valve receives gas from the main shut off valve (12) and supplies gas at a regulated pressure (Col. 3, lines 17-20). Applicants note that the pressure regulator 14 of the instant invention also serves to deliver pressure regulated gas (paragraph [0016]), which is similar to the function provided by the pressure regulator (C) of Bergquist.

Accordingly, Bergquist clearly uses distinct terminology for a valve and a pressure regulator in the context of a gas range system. Bergquist also clearly specifies the functionality of its pressure regulator (C) as that of supplying gas at regulated pressure, similar to the pressure regulator 14 delivering pressure regulated gas. In applying the Bergquist reference to the instant claims, the Office Action assumptions are contrary to the description of the pressure regulator in Bergquist. Applicants respectfully submit that the Office Action selectively equates a conventional valve with a pressure regulator.

Further, the Office Action states in point 10 that 'the Bergquist valve is regarded as being capable of either increasing or decreasing the pressure as desired, as it has the identical structure to Applicant's disclosed valve'. Applicants understand that by the phrase 'Applicant's disclosed valve', the Office Action intends to refer to the pressure regulator 14. According to the reasoning presented in the Office Action, the Bergquist valve has identical structure to a pressure regulator, in general. However, Applicants note that if this were true, there would be no requirement in Bergquist to have distinct valves and pressure regulator, and at least Bergquist would not require to combine a manual valve and a pressure regulator, and reference them as distinct devices. Given the apparent contradiction, Applicants submit that the Office Action reasoning of equating a shut off valve with a pressure regulator is erroneous at least as expressly disclosed in Bergquist.

Furthermore, the Examiner seems to suggest that the valve 12 functions to pressure regulate the gas flow in the same manner as performed by a pressure regulator. Applicants respectfully submit that as is well known in the art, and also indicated by Bergquist, providing a pressure regulated gas flow is very different than providing a binary state of allowing or not allowing a gas flow, as achieved by a shut off valve. Applicants submit that while it may be argued that the gas pressure is reduced (substantially to zero) when the valve 12 is in a shut off state, and is increased (to a pressure of an incoming gas supply line) in a switch on state, it is well established in the art that such shut off and switch on operation does not amount to pressure regulation of the gas in a gas range system. Accordingly, the Office Action seems to apply equivalence between the valve and the pressure regulator, contrary to the accepted understanding in the art.

The instant invention presents the pressure regulator 14 to deliver pressure regulated gas flow to the fuel boost pump. In contrast, the Office Action suggests that the Bergquist valve 12, which delivers gas without any regulation, supplies the pressure regulator, thereby disregarding the part-to-part relationship between the claimed elements.

Proceeding contrary to the accepted wisdom of the prior art is strong evidence of nonobviousness. *Id.* at 312 (citing *United States v. Adams*, 383 U.S. 39 (1966)). "[I]t is error to treat the claim as a mere catalog of separate parts, in disregard of the part-to-part relationships set forth in the claim that give the claim its meaning. The focus must always be on the entirety of the claimed invention." *Structural Rubber Products Co. v. Park Rubber Co.*, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984).

Accordingly, Applicants respectfully submit that Bergquist does not disclose a pressure

regulator as taught in the instant invention. Further, Smith fails to obviate this deficiency. Therefore, the applied references do not teach all the elements of the claimed invention.

As discussed above Bergquist does not disclose a pressure regulator, and accordingly, the proposed combination with Smith would not result in a system as claim in the present invention.

Second, the primary reference Bergquist does not teach or suggest a gas fuel boost pump as alluded in the Office Action. Further, the variable speed or variable displacement pump in secondary reference Smith does not obviate this deficiency in Bergquist and this clearly indicates neither of the references discloses a gas fuel boost pump. While Smith may discuss a variable speed or variable displacement pump, Smith does not teach pressure boosting of the gas flow, or specifically, a gas fuel boost pump disposed downstream of the pressure regulator and configured to increase a primary air entrainment in the venturi by increasing pressure of the gas flow. Smith merely teaches a pump for providing fuel to be mixed with air at very high pressures, for example, operating pressures of gas turbine engines that are significantly higher than the atmospheric pressures, while in the instant invention, the pressure boosted fuel gas is mixed with air in the venturi of a gas burner, which operates at atmospheric pressures. Given the significant pressure difference, the comparison of Smith's pump to the gas fuel boost pump of the instant invention fails to acknowledge the part-to-part relationship of the claimed elements.

Furthermore, as submitted earlier, Smith teaches a servo control loop-regulating pump configured to regulate a flow rate demand and compare this with the flow rate measured by the flow sensors. In contrast the present invention does not regulate a flow rate at this stage, but in fact increases pressure of gas flow to increase primary air entrainment if the gas (fuel).

Applicants submit that even if the valve of Bergquist were to be replaced with a variable speed or variable displacement pump of Smith the system would not have a gas fuel boost pump. Further, such system will not be able to achieve a *pressure boost* of the gas flow from the gas feed line. In sharp contrast, Smith teaches that a constant pressure is maintained between inlet and outlet by varying size of the metering profile defined the meter profile 10 and the opening 12 in col 3. lines 55-57:

"Thus, a constant pressure is maintained between the inlet 5 and the outlet 11 by varying the size of the metering profile defined between the meter profile 10 and the opening 12." (Emphasis added)

However, the present invention provides enhancing performance of a gas burner by increasing air entrainment of the gas flow received from the gas feed line. In particular, the primary air enhancement is increased via increasing the pressure of the gas flow by a *gas fuel boost pump* that is disposed downstream of the pressure regulator, which delivers a pressure regulated gas flow to the gas fuel boost pump.

Applicants further submit that such fuel regulating pumps are well known and used for pressure control and to maintain a flow rate demand. See, Smith Col. 5, lines 22-24. In light of the above, Smith fails to disclose a gas fuel boost pump of the instant invention, which deficiency is not supplied by Bergquist, and therefore, Bergquist and Smith, even in combination do not teach the instant invention.

Applicants further submit that the hypothetical combination of Bergquist and Smith would not result in a device as claimed in the instant invention. For example, according to the proposed combination in the present Office Action, the combined manual shutoff valve and pressure regulator (C) of Bergquist is replaced by Smith's pump to increase the pressure, in a manner similar to that of the instant invention. In such a combination, the supply shut-off valve will provide the gas flow at the same pressure as that of the gas supply line. The gas supply line pressure typically ranges between 5 to 10 inches of water column (see Applicants' Specification, paragraph [0017]). The gas fuel will then be incident to the pump of Smith at this variable pressure. Even if the Smith pump boosts the pressure of the gas supply in a manner similar to that proposed in the current invention, such a combination will supply gas at randomly varying pressures to the burner ports. Such a variation in pressure of gas at the burner ports could vary the flame length or could even cause the burner ports/venturi or other components of the gas range system to burst, rendering the gas range system unsafe for use, and thereby defeating the objective as proposed by the instant invention.

Applicants further note that in order to construct the claimed invention, as discussed above, the Office Action has selectively supplied elements from isolated disclosures, in a manner that disregards the part to part relationships. Accordingly, Applicants respectfully submit that the combination used to render the instant invention obvious is hindsight reconstruction.

Therefore, Applicants submit that independent claims 40, 11, 34 are allowable over the proposed combination of Bergquist in view of Smith under 35 USC 103(a) for at least the

reasons cited above, and respectfully request the Examiner to reconsider the rejection of the claims.

Neither of the other applied references, including Frasnetti and Rothenberger supply the above stated deficiencies in the combination of Bergquist in view of Smith.

Accordingly, claims 2-10, 12-21, and 36-39 depend from independent claims 40, 11 and 34, respectively. Applicants respectfully submit that inasmuch as independent claims 40, 11 and 34 are allowable, these claims are allowable at least by virtue of their dependency from an allowable base claim.

Claims 22 and 29

Independent claim 22 recites, "A method of enhancing performance of a gas burner, having a gas as fuel comprising: actively increasing pressure of a gas flow through a gas feed line via a gas fuel boost pump disposed downstream of a pressure regulator coupled to the gas feed line; and regulating the gas flow of the gas fuel boost pump based upon a user-defined input to regulate a burner heat output to a desired burner output." (Emphasis added)

Independent claim 29 recites, *inter alia*, "increasing pressure of a current gas flow through a gas feed line via a gas fuel boost pump disposed downstream of a pressure regulator coupled to the gas feed line; measuring a parameter of gas flow from the gas fuel boost pump at a predetermined location via a transducer; and regulating the gas flow through the gas fuel boost pump based upon a user-defined input and a signal received from the transducer." (Emphasis added)

Applicants submit that independent claims 22 and 29 recite, in generally similar language, a method of *increasing gas flow through a gas feed line via a gas fuel boost pump disposed downstream of the pressure regulator*.

In support of rejection of claim 22, the Examiner argued that it would have been obvious to modify Bergquist in view of Smith, and further in view of U.S Patent 5,924,857 (hereinafter "Frasnetti"). Applicants respectfully traverse this rejection.

As discussed, Bergquist and Smith, either alone, or in combination *do not* disclose a pressure regulator, and further do not disclose a gas fuel boost pump disposed downstream of the pressure regulator and configured to increase pressure of the gas flow from the gas feed

line as recited by the present claims. Frasnetti does not supply the deficiencies in the combination of Bergquist and Smith. Applicants respectfully submit that at least for these reasons, claim 22 is patentable under 35 USC 103(a) in view of Bergquist, Smith and Frasnetti.

Further in support of rejection of claims 22-27, Examiner argued that it would have been obvious to modify Bergquist in view of Smith, and further in view of U.S Patent 6,287,108 (hereinafter "Rothenberger"). Applicants respectfully submit that, in decision on Appeal by the board mailed on 27 October 2008, Appeal 2008-0555, page 4:

"Rothenberger does not disclose a gas fuel boost pump disposed downstream for a pressure regulator and adapted to increase pressure of the gas flow received from the gas feed line, as recited in independent claims 1, 11, 34, nor does Rothenberger disclose the step of actively increasing pressure of a gas flow through a gas feed line via a gas fuel boost pump disposed downstream of a pressure regulator coupled to the gas feed line, as recited in independent claims 22 and 29." (Emphasis added)

As evident in the decision on appeal, and as discussed above, Bergquist and Smith, either alone or in combination, do not supply all the claimed limitations, for example, disclose a gas fuel boost pump disposed downstream for a pressure regulator and adapted to increase pressure of the gas flow. Rothenberger does not supply these deficiencies of the Bergquist and Smith combination. Applicants respectfully submit that the proposed combination of Bergquist in view of Smith and Rothenberger fail to disclose all features of the present independent claims 22 and 29.

For at least these reasons among others, claim 22 and its dependent claims 22, 23, 28-33, and claim 29 and its dependent claims 30-33 are believed to be allowable. Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103.

Summary

For the reasons set out above, Applicant respectfully submits that the application is in condition for allowance. Favorable reconsideration and allowance of the application are, therefore, respectfully requested.

If the Examiner believes that anything further is necessary to place the application in better condition for allowance, the Examiner is kindly asked to contact Applicant's undersigned representative at the telephone number below.

Additional extensions of time as necessary to allow consideration of this paper are hereby petitioned under 37 C.F.R. 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 07-0868.

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Respectfully submitted,
/Patrick Patnode/
Patrick K. Patnode
Reg. No. 40,121
General Electric Company
Building K1, Room 3A54A
Niskayuna, New York 12309
Telephone: (518) 387-5286